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A new candidate for a Gondwanaland distribution in the Zodariidae (Araneae): *Australutica* in Africa

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Abstract

Two new species of *Australutica* Jocqué, 1995, a genus formerly only known from Australia, are described from South Africa: *A. africana* **n. sp.** from Soutpansberg and *A. normanlarseni* **n. sp.** from the Cape Peninsula. The taxonomic position of the new species is discussed and a key to the species of *Australutica* is provided.

Keywords

New species, Gondwanaland, Soutpansberg, Araneae

Introduction

The typical Gondwanaland distribution with representatives in three continents, Africa, Australia and South America, often restricted to the southern parts of the continents, is a well known and relatively common phenomenon of vicariance. In the spider family Zodariidae only one example is known. The genus *Cyrioctea* Simon has been found on all three the continents and as expected only in the southern parts (Platnick & Griffin, 1988; Platnick & Jocqué, 1992). Other transcontinental distribution patterns like those of the zodariid genera *Mallinella* Strand and *Asceua* Thorell have a completely different origin and are the result of dispersion (Jocqué, 1993).

The best candidates for a Gondwanaland distribution are ancestral taxa (Jocqué, 1991), which is the case for *Cyrioctea* and the representatives of the subfamily Lachesaninae. A combination of plesiomorphic characters in this subfamily are the

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chelicerae with dense frontal cover of setae; cheliceral teeth; fangs which are longer than wide at the base; the eyes in two rows; the abdomen with a complex dark pattern and one of the main synapomorphies are the long, cylindrical and retractile anterior lateral spinnerets.

In 1995, Jocqué described the genus *Australutica* for four Australian species characterized by numerous spines on the anterior legs. Recently two species of *Australutica* were found in South Africa, both in areas with a high degree of endemicity. The first species is from the Soutpansberg, the second from the Cape Peninsula. Both these areas can be considered as conservative. The Soutpansberg is one of the oldest formations in southern Africa and it is assumed that this geomorphologic feature was created by faulting that occurred about 150 Ma ago (Haddon & McCarthy, 2005; Ranganai et al., 2002) and that during the last ± 60 Ma, erosion formed the landscape as we see it today (Partridge & Maud 2000). The Soutpansberg species occurs in open woodland with grassy and rocky patches. The Cape Peninsula species was collected from dunes. Dunes and shorelines are among the most conservative biomes on earth because of their unaltered structure, independent from major shifts in vegetation cover occurring in other biomes (Jocqué, 2001). Of all the genera in the two ancestral zodariid subfamilies Cyriocteinae (*Cyrioctea*) and Lachesaninae (*Lachesana*, *Antillorena* Jocqué, *Australutica*, *Lutica* Marx) at least one species in each genus occurs in sandy desert areas or on beaches along the coast. The presence of *Australutica* in the sandy dunes of the Cape Peninsula is therefore a corroboration of this finding.

Material and methods

All measurements are in mm.

Specimens were observed and measured with a Leica M10 stereomicroscope. Photographs were taken with Leica MZ16 and the LAS automontage software.

Abbreviations:

NCA: National Collection of Arachnida, ARC-Plant Protection Research Institute (Pretoria); ALE: anterior lateral eyes; AME: anterior median eyes; AW: anterior width; F: femur; L: length; MRAC: Royal Museum for Central Africa (Tervuren); Mt: metatarsus; P: patella; PLE: posterior lateral eyes; PME: posterior median eyes; PW: posterior width; RTA: retrolateral tibial apophysis; SAM: Iziko South African Museum (Cape Town); t: tarsus; T: tibia.

Taxonomic position

Australutica (urn:lsid:zoobank.org:act:10E438FC-8313-45DA-869C-7EA25BAB0DEE) belongs to the Lachesaninae and was so far believed to be restricted to Australia. The species described in this paper occur in an area with a very high diversity of

Zodariidae, mainly belonging to the subfamily Cydrelinae which has its diversity in southern Africa. A recent phylogenetic analysis of the Zodariidae (Jocqué, in preparation) shows that the *Cydrela* Thorell is at the base of the Cydrelinae but shares a number of characters with the Lachesaninae. Among these are cylindrical and retractable anterior lateral spinnerets and a male palpal cymbium with dispersed thin spines. However, there are numerous characters that separate *Australutica* and *Cydrela* (Table 1).

The inclusion of the new species in *Australutica* is supported by the following diagnostic characters: eye rows slightly procurved; prosoma yellow with darker pattern; abdomen with poorly delimited complex pattern; chelicerae with teeth; length of cheliceral fangs about three times width at base and spiniform scopulae on tarsi. The structure of the male palp differs in the absence of the median apophysis in the Australian species but this is a phenomenon found in several zodariid genera where species with and without this apophysis occur. On the other hand, the apophysis at the base of the embolus is a remarkable synapomorphy of *Australutica* supporting the inclusion of the African taxa in this genus. It should be noted that the similarities concern the type species *A. moreton* Jocqué and not *A. quaerens* Jocqué, one of the other Australian species, which was only tentatively included in the genus (Jocqué, 1995) as it lacks some of the synapomorphies.

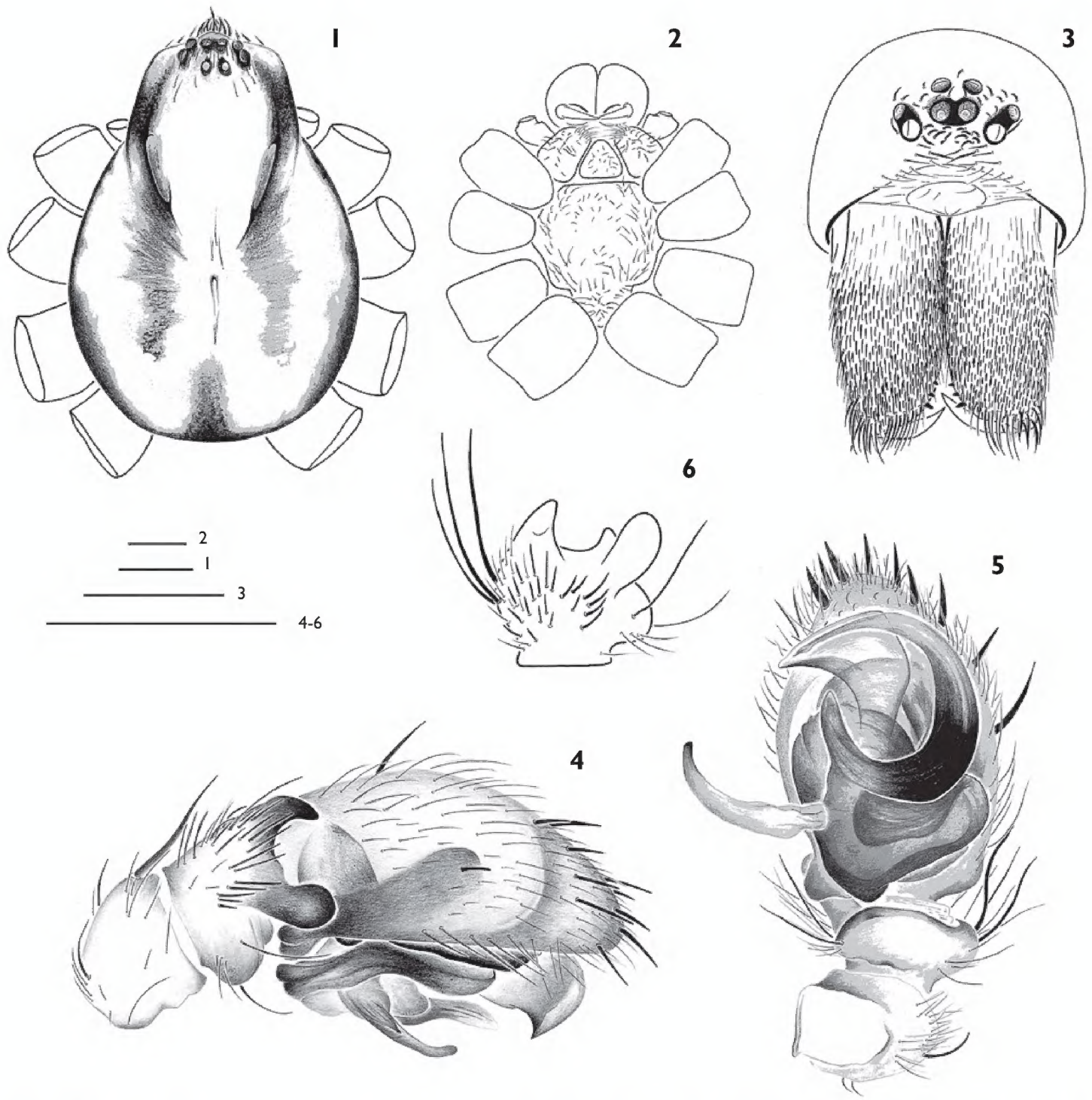
Key to the species of *Australutica*

Note: only the female of one species of *Australutica* is known: *A. xystarches* Jocqué, 1995. Females are thus not considered in this key.

1. Retrolateral tibial apophysis (RTA) with a dorsolateral and a ventrolateral prong (Fig. 6) 2
– RTA with one prong only 3
2. Ventrolateral prong of RTA rounded; median apophysis tapered and smoothly curved ..... *A. africana* n. sp.
– Ventrolateral prong of RTA pointed; median apophysis widened medially and strongly curved at tip (Fig. 10) ..... *A. normanlarseni* n. sp,
3. RTA strongly bent down at tip; embolus turning clockwise on right palp .... *A. quaerens* Jocqué
– RTA hardly bent; embolus turning anticlockwise on right palp 4
4. RTA with broad base with almost parallel sides; abdomen with a large dark central patch wider in posterior half ..... *A. moreton* Jocqué
– RTA gradually tapered from base to tip; abdomen with two rows of small transverse stripes ..... *A. manifesta* Jocqué

Table 1. Principal differences between *Australutica* and *Cydrela*

	Australutica	*Cydrela*
Eyes	2 rows	3 rows
Sternum	elongate	Broad
Precoxal sclerites	absent	1 pair
Chelicerae	with teeth on promargin	without teeth on promargin
Cheliceral fang	three times as long as wide at base	twice as long as wide at base
Anterior legs	densely spinated	with few spines
Scopula	dense spiniform scopula	no scopula



Figs 1-6. *Australutica africana* n. sp. male 1. cephalothorax, dorsal view; 2. cephalothorax, ventral view; 3. cephalothorax, frontal view; 4. right male palp, retrolateral view; 5. right male palp, ventral view; 6. right male palpal tibia, dorsal view. (scale bars: 0.5 mm).

Descriptions

Australutica africana n. sp.
urn:lsid:zoobank.org:act:40BD6CA4-1A94-445F-9CDA-BE42EFF39DB6
Figures 1-7

Type material Holotype: male: South Africa, Limpopo Province, Soutpansberg, Lajuma, 23°02'29"S 029°26'45"E, 17.XI.2004, pitfalls in woodland, M. Mafadza (NCA 2006/1002).

Paratypes: 4 ♂: together with holotype (1 ♂ in MRAC 223765).

Other material examined None.

Diagnosis Males of this species are recognized by the slightly swollen tibiae and metatarsi I, with spiniform scopulae on tarsi I and by details of the palp: the inferior prong of the RTA is rounded; the distal tegular apophysis is very large and has an angular prolateral edge; the median apophysis is tapered towards the tip.

Etymology This species is the first representative of the genus on the African continent.

Description Male: total length 5.00 mm; carapace 2.68 mm long, 1.88 mm wide, TI + PI: 1.92.

Colour: carapace yellow, darkened along margin and with two black longitudinal bands and a black spot behind the fovea (Figs 1, 7); fovea orange. Sternum pale yellow, slightly suffused with black along lateral margins. Chelicerae brownish yellow. Legs yellow except femora with broad dark distal rings on all pairs and smaller dark patches at the base of posterior pairs; tibiae with faint darker suffusion on sides. Abdomen pale; dorsum with faint darker pattern delimiting pale chevrons on posterior part. Spinnerets pale yellow.

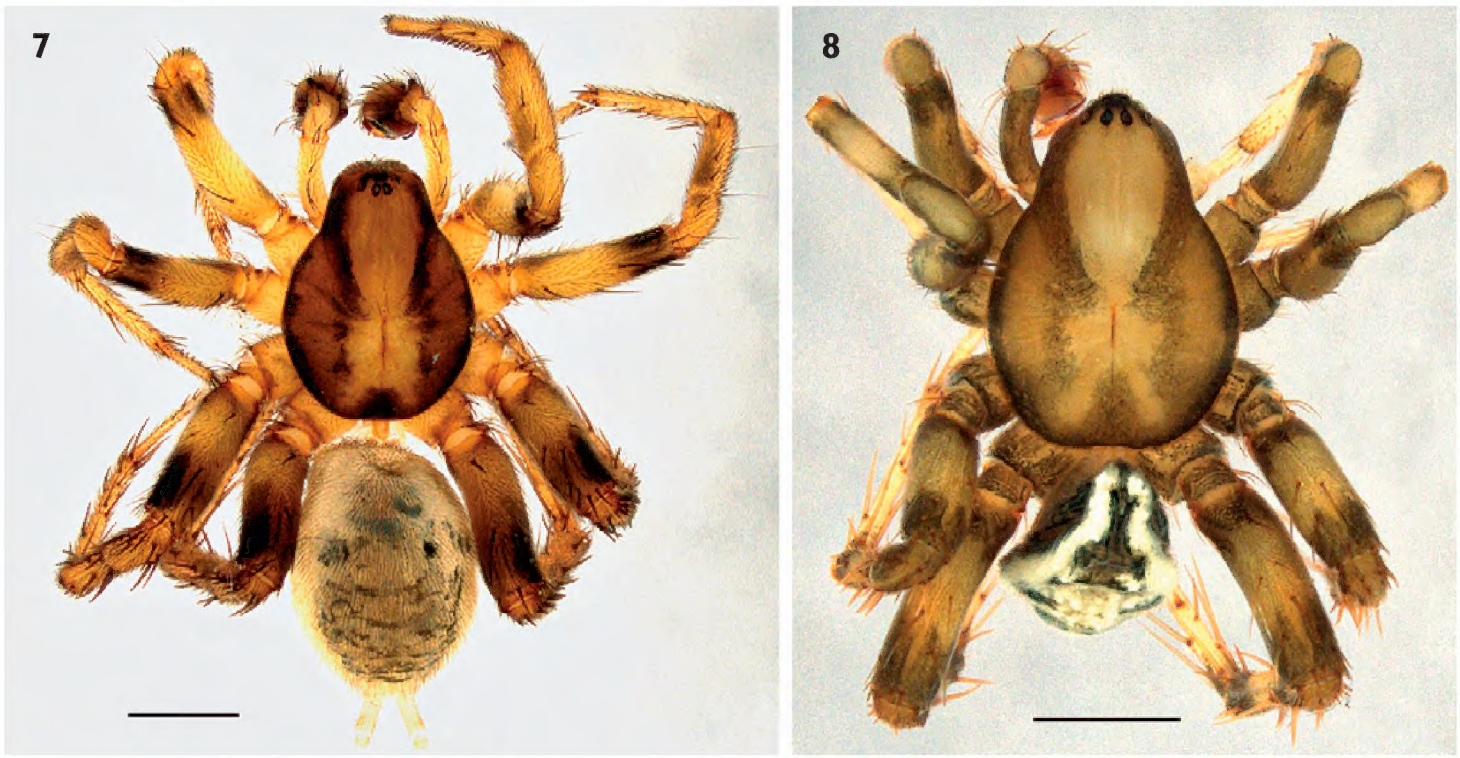
Carapace smooth; in profile slightly elevated in cephalic area; with cluster of short setae in front of anterior eyes and in median ocular area (Fig. 3).

Eyes: AME: 0.08; ALE: 0.10; PME: 0.08; PLE: 0.08; AME-AME: 0.05 AME-ALE: 0.05; PME-PME: 0.05; PME-PLE: 0.10. MOQ: AW = 1.00 PW; AW = 0.87 L; clypeus 0.15 mm high or 1.8 times diameter of ALE. Sternum: 1.12 mm wide, 1.32 mm long (Fig. 2). Chilum single, oval, with a few setae: 0.26 mm wide, 0.08 mm high. Chelicerae with dense cover of setae (Fig. 3), fang three times as long as wide at base, promargin with three teeth.

Legs fairly short. Tarsi all cylindriform, with strong spiniform scopulae sensu Jocqué 1991 (p. 13). Metatarsi I with spiniform setae. Tibiae I and metarsi I slightly swollen. Spines numerous on anterior legs, very numerous and long on posterior ones.

Spination:

	Fe	P	T	Mt	t
I	pl1d1-1-2rl1	–	pl3v1-2-2	pl1rl1v1-2	–
II	d1-1-2rl1	pl1	pl3v1-2-2	pl1rl1v2-1-2	–
III	pl1d1-1-1-2	pl5d4-1rl2	pl1-1-1d1-1-2rl3v1-1-2	10disp dw6	10disp
IV	d1-1-1-1-2	pl5d1-1rl2	pl1-1d1-1-1r13v1-1-2	14disp dw6	12disp



Figs 7-8. 7. *Australutica africana*, male habitus, dorsal view; 8. *Australutica normanlarseni*, male habitus, dorsal view. (scale bars: 0.5 mm).

Palp (Figs 4-6): Cymbium with dispersed thin spines. Tibia with well developed retrolateral apophysis with two short prongs curved towards each other, dorsal one with sharp, inferior one with rounded tip; tegulum broad, sclerotized at base; base of sickle shaped embolus with long prong pointing forward, covering base of terminal distal apophysis which is widened towards tip; median apophysis tapered towards extremity.

Female unknown.

Distribution Only known from type locality.

Australutica normanlarseni n. sp.
urn:lsid:zoobank.org:act:C9D7C09A-90E6-4649-88A6-150443B66C75
Figures 8-10

Type material Holotype: male: South Africa, Western Cape Province, Cape Peninsula, Kommetjie, 34°18'S 18°24'E, 22.XII.1992, on white dune sand on koppie, N. Larsen (SAM C 2593).

Other material examined None.

Diagnosis Males of this species are recognized by the details of the palp: both the prongs of the RTA are sharp, the distal tegular apophysis has a rounded prolateral edge and the median apophysis is fairly broad, somewhat enlarged in the middle and with a short sharp turn at the end.

Etymology Named after Norman Larsen, a dedicated collector of spiders who found the holotype, the only specimen of this species so far known.

Description Male: total length 3.60 mm; carapace 2.36 mm long, 1.72 mm wide, TI + PI: 1.60.

Colour: carapace pale yellow strongly suffused with black on sides leaving a pale central pattern (Fig. 8); fovea orange. Sternum pale yellow, broadly suffused with black along lateral margins. Chelicerae brownish orange. Legs pale yellow, femora and tibiae with distal and proximal black ring, patellae dark on sides; tarsi and metatarsi pale yellow. Abdomen white on dorsum with dark pattern consisting of dark frontal mark followed by two pairs of black spots and dark transverse stripe in front of spinnerets; sides dark; venter brownish orange. Spinnerets pale yellow.

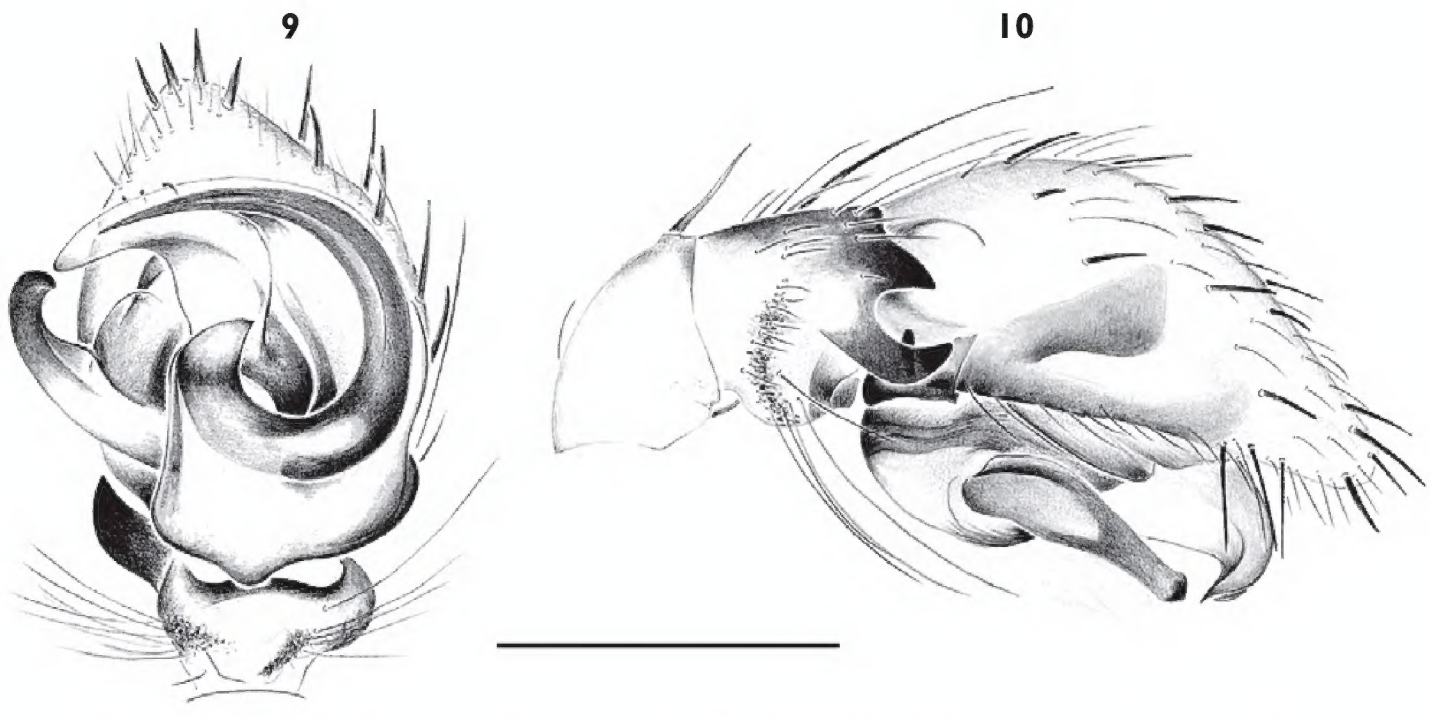
Carapace smooth; in profile slightly elevated in cephalic area; with cluster of short setae in front of anterior eyes.

Eyes: AME: 0.08; ALE: 0.08; PME: 0.08; PLE: 0.08; AME-AME: 0.05 AME-ALE: 0.05; PME-PME: 0.07; PME-PLE: 0.10. MOQ: AW = 0.93 PW; AW = 0.87 L; clypeus 0.18 mm high or 2.2 times diameter of ALE. Sternum: 1.00 mm wide, 1.12 mm long. Chilum single, roughly oval with a few setae: 0.52 mm wide, 0.11 mm high. Chelicerae densely covered with setae, with one tooth on promargin; fang almost three times as long as wide at base.

Legs fairly short. Tarsi all cylindriform, with strong spiniform scopulae sensu Jocqué 1991 (p. 13). Spines numerous on anterior legs, very numerous and long on posterior ones.

Spination:

	Fe	P	T	Mt	t
I	d1-1-1-2rl1	d1	pl1d1-1v2-2-2	pl1rl1v2 group 15 dw4	–
II	d1-1-1-2rl1	pl1	pl1d1-1v1-2-2	pl1d1rl1cv2-2-1 dw4	–
III	pl1d1-2-1-2	pl5d3rl2	pl1-1-1d2-1-1r1-1v2-2-2	12disp dw6	pl5rl1
IV	pl1d1-2-1-1-2	pl5d3rl2	pl1-1-1d2-1r1-1v1-2-2	14disp dw6	pl3rl1



Figs 9-10. *Australutica normanlarseni* n. sp. male 9. right male palp, ventral view; 10. right male palp, retrolateral view. (scale bar: 0.5 mm).

Palp (Figs 9-10): Cymbium with dispersed thin spines. Tibia with well developed lateral apophysis with two short prongs curved towards each other, both with sharp tip; tegulum broad, membranous at base; base of sickle shaped embolus with triangular tip pointing forward, covering base of terminal distal outward curved apophysis; median apophysis fairly broad, somewhat enlarged in the middle and with short sharp turn at extremity.

Female unknown.

Distribution Only known from type locality.

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